USER'S GUIDE

Thermal Printer

DPU-414

Read this manual carefully before using the printer.
Keep this manual in a place where it can be accessed quickly.

Seiko Instruments Inc.

DPU-414 THERMAL PRINTER USER'S GUIDE
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Türkiye' deki Kullanıcılar için
EEE Yönetmeliğine Uygundur.

Applicable EC Directives & standards:

Directives

2004/108/EC	EC Electromagnetic Compatibility Directive
2006/95/EC	EC Low Voltage Directive

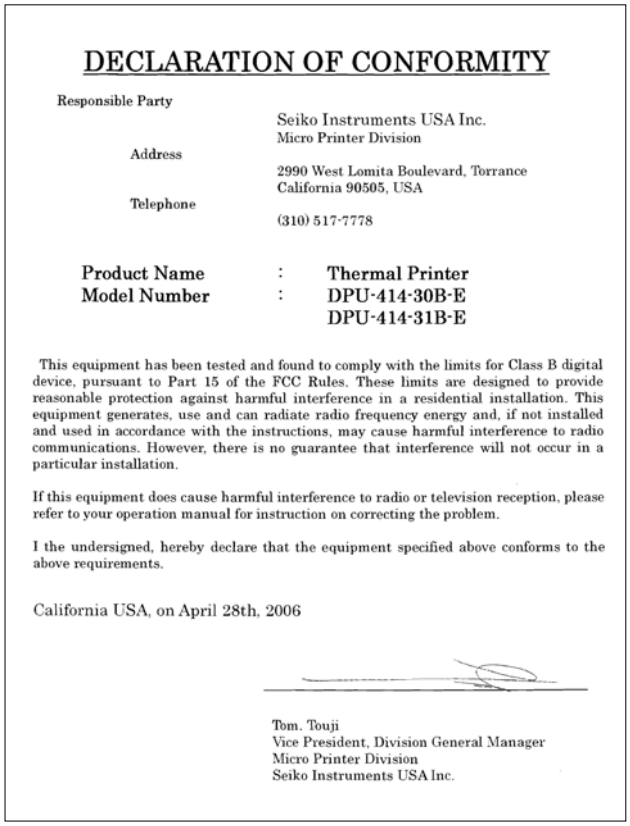
Standards

EMI:	EN55022	Class B
	EN61000-3-2	
	EN61000-3-3	
EMS:	EN55024	
	EN61000-4-2, EN61000-4-3, EN61000-4-4,	
	EN61000-4-5, EN61000-4-6, EN61000-4-8,	
	EN61000-4-11	
LVD:	EN60065	

Federal Communications Commission (FCC) compliance statement
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes in this certified device could void your legal right to operate it.



DECLARATION OF CONFORMITY

Responsible Party

Seiko Instruments USA Inc.
Micro Printer Division

Address

2990 West Lomita Boulevard, Torrance
California 90505, USA

Telephone

(310) 517-7778

Product Name	:	Thermal Printer
Model Number	:	DPU-414-30B-E
		DPU-414-31B-E

This equipment has been tested and found to comply with the limits for Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, use and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, please refer to your operation manual for instruction on correcting the problem.

I the undersigned, hereby declare that the equipment specified above conforms to the above requirements.

California USA, on April 28th, 2006

Tom. Touji
Vice President, Division General Manager
Micro Printer Division
Seiko Instruments USA Inc.

Industry Canada (IC) compliance statement
Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

INTRODUCTION

Thank you for purchasing the DPU-414 thermal printer.

This USER'S GUIDE explains how to handle DPU-414 thermal printer (hereinafter referred to as printer), specified AC adapter, specified battery pack and specified AC cable (hereinafter, omit "specified").

This USER'S GUIDE applies to the following product.

・DPU-414-30B-E

Read through the Safety Precautions on Page 2 to 6 carefully before using the printer.

This manual consists of the following sections.

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SAFETY PRECAUTIONS

The following symbols are used in this manual in order to make use of the printer properly and prevent the printer from being damaged.

Follow the instructions marked with the symbol.

WARNING	Severe Personal Injury or Death Failure to follow the guidelines marked with this symbol could result in severe personal injury or death.
CAUTION	Minor Personal Injury or Product and/or Peripheral Damage. Failure to follow the guidelines marked with this symbol could result in minor personal injury or product and/or peripheral damage.

⚠ WARNING

- DO NOT use an AC adapter, battery pack or AC Cable other than that which is specified. Doing so may cause fire leading to serious accidents.
- DO NOT use the printer, AC adapter and AC cable in the country which has not complied with regulations. Doing so, we do not assure the safety of these products and you will be responsible for violation of regulations.
- DO NOT bend the power cable forcibly, or place heavy object on the cable because it might damage the cable and cause fire or electric shock. If the power cable is damaged, discontinue use and replace it immediately.
- DO NOT throw the battery pack into a fire or apply heat because it may cause the battery pack to explode causing physical injury or property damage.
- DO NOT put the battery into water or use in a place where it could get wet because it may cause fire or electric shock.
- DO NOT disassemble the battery pack because it may cause the battery pack to heat up and catch fire, leading to other serious accidents.
- DO NOT short the battery pack terminals as it may lead to fire, electric shock, or personal injury.
- DO NOT subject the battery pack to direct sunlight or high temperature as it may lead to fire or personal injury.
- If any fluid from the battery pack gets in your eyes, immediately flush with water and seek medical treatment from a trained doctor.

⚠ CAUTION

- ◆ DO NOT allow metal or liquids to touch the internal parts or slot of the printer. Doing so may cause fire, electric shock, or other accidents.
- ◆ DO NOT disassemble or remodel the printer. DO NOT REPAIR THE PRINTER YOURSELF. Doing so may cause fire, electric shock or other accidents.
- ◆ Never use the printer in a place of extreme humidity or any place where it can possibly be splashed by any liquids. If any liquids get into the printer, it could lead to fire, electric shock, or other serious accidents.
- ◆ Be sure to hold the connector part of the power cable or interface cable when disconnecting the cable. Pulling on the cable portion may cause it to fray and break.
- ◆ Power OFF the printer, unplug the power cable from the power outlet, and remove the battery pack in any of the following cases:
  - The printer does not recover from an error.
  - Smoke, strange noise or smells erupt from the printer.
  - A piece of metal or any liquid touches the internal parts or slot of the printer.
- ◆ Using the printer in any manner other than for which it was designed may cause accidents or fire.

OPERATING PRECAUTIONS

Please follow the precautions below to enjoy and maintain the full performance of the printer.

Using the printer

- Be careful not to drop or bump the printer.
- DO NOT leave the printer in direct sunlight. Install the printer in a location with the following conditions:
  - Ambient temperature: 32 to 104 °F (0 to 40 °C)
  - Relative humidity: 30 to 80% RH (non-condensing)
- DO NOT connect the power cables of the AC adapter or the AC adapter with battery charger to the same outlet as devices that generate electromagnetic fields.
- DO NOT power off while printing.
- Switch the power off when not in use.
- When not using the printer for extended periods of time, remove the battery pack from the printer. Disconnect the power cable of the AC adapter from the outlet.
- Clean the printer using soft, lint-free cloth.
- Do not use alcohol or other solvent.
- Before use, always clean the terminals using a dry, soft, lint-free cloth. If the terminals are dirty, it may not be possible to obtain proper contact.
- The AC adapter and the battery pack become warm when in use. This is normal and is not a malfunction.
- The length of time the printer can be used may be shortened when using a battery pack at low temperature.
- For assistance with obtaining an exchange battery for this product in the USA, please contact:
  tpdrecycleinfo@siu-la.com
  Seiko Instruments USA inc.
  Thermal Printer Div.

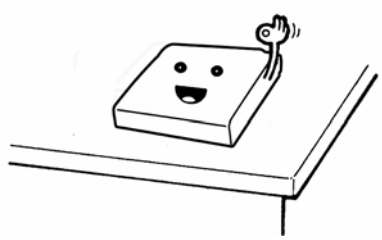
Thermal Paper Handling

- Store the thermal paper in a cool, dry, and dark place.
- Do not rub the paper with hard objects.
- Do not leave the paper near organic solvents.
- Do not allow plastic film, erasers, or adhesive tape to touch the paper for long periods.
- Do not stack copies made by the Diazo or wet process on top of the thermal paper.

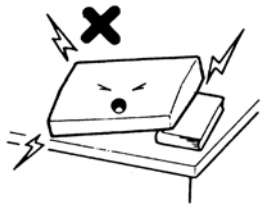
- ◆ Do not use chemical glue.
- ◆ Always use the specified thermal paper TP-411L.

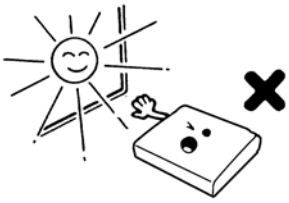
Installation

- ◆ Install the printer in a flat, stable place.

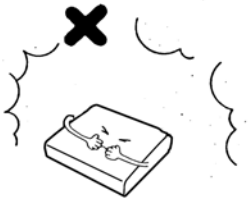


- ◆ Do not install the printer in the following places:
  - Places with strong vibration
  - Places with oily or iron dust
  - Hot or cold places
  - Humid places





More than 104°F (40°C)



Less than 32°F(0°C)

More than 80%RH

NOTATIONS USED IN THIS MANUAL

The following two types of notations are used throughout this manual to denote items of caution and items to remember:

NOTE

◆ This box contains items that when not followed may lead to a malfunction or to a deterioration of performance.

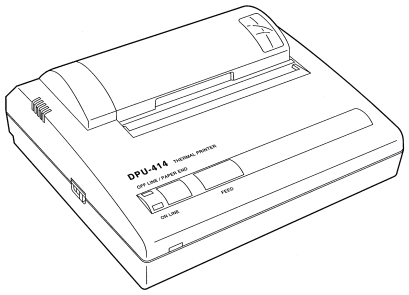
HINT

- This box contains helpful hints to remember when using the printer.

1 PREPARATION

1.1 Unpacking

Once you have opened the carton, make sure it contains the printer and all accessories.
The standard configuration contains the following 3 items:

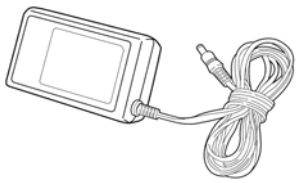


Printer

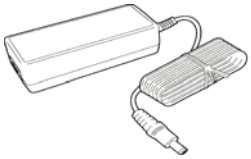
Thermal paper

USER'S GUIDE/ SAFETY PRECAUTIONS
(CD-ROM)

The option configuration contains the following items:

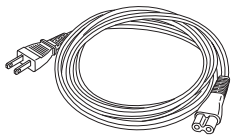


PW-4007-EC-E



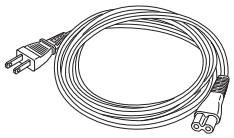
PW-4007-JU1-E

Specified AC Adapter



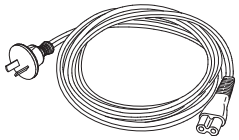
CB-CE01-18B-E

Specified AC Cable
(for PW-4007-EC-E only)



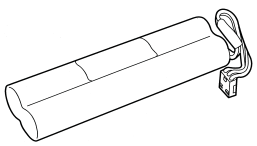
CB-US04-18A-E

Specified AC Cable
(for PW-4007-JU1-E only)



CB-AU01-20A-E

Specified AC Cable
(for PW-4007-EC-E only)



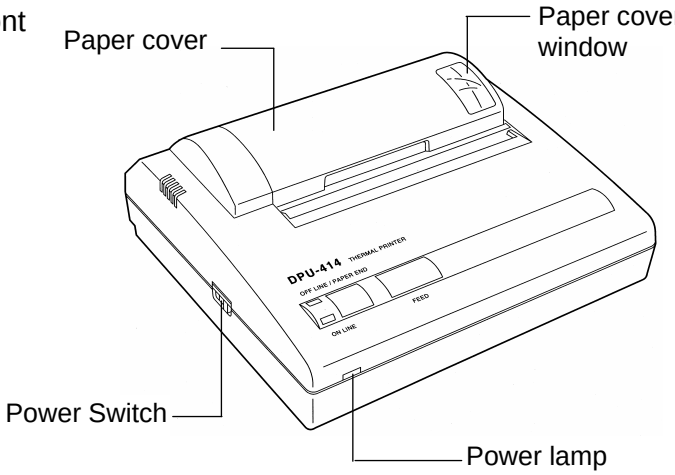
BP-4005-E

Specified Battery pack

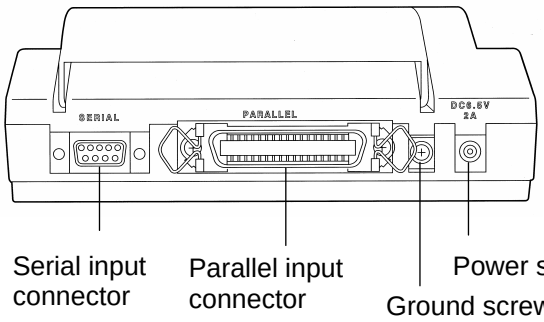
The AC adapter does not include the AC cable. Please be sure to purchase SII specified options.

1.2 Part Names

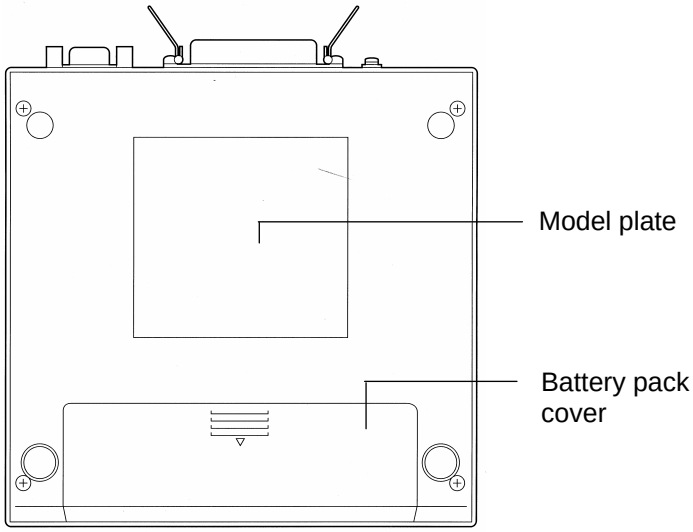
Front



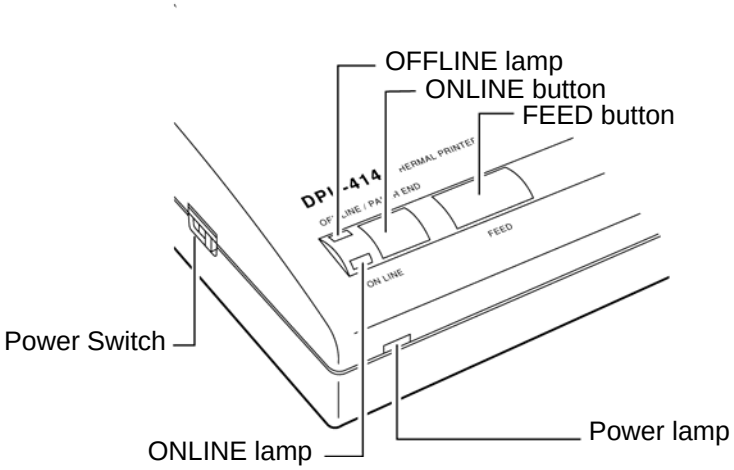
Back



Bottom



1.3 Operation Panel



1	Power Switch	Slide the power switch to turn the power on (ONLINE) or off.
2	FEED button	Feeds paper when pressed in OFFLINE mode. (See the Hint on the next page).
3	ONLINE button	Press to toggle between OFFLINE and ONLINE.
4	Power lamp	Indicates the power is on. Blinks once every second to indicate the battery is being charged. Blinks once every 1/2 second to indicate the battery is low.
5	ONLINE lamp	Indicates the printer is ONLINE. Blinks to indicate there is data in the buffer memory when the printer is OFFLINE.
6	OFFLINE lamp	Indicates the printer is OFFLINE. If the paper is not set or has run out, the lamp flashes. When an error occurs, both the ONLINE and off-line lamps light.

NOTE

- ◆ DO NOT press and hold the ONLINE button and FEED button for 30 seconds or more, because it will cause the DIP switches to reset and you will not be able to use the printer.
- ◆ Be sure the thermal head is in the home position (at the far left) before turning off the power switch. If left away from the home position for a long period, the print quality might deteriorate.

HINT

- ONLINE : Set the printer ONLINE to print from the computer.
- OFFLINE : Set the printer OFFLINE to feed paper with the FEED button or to stop printing.
  (Print data and commands cannot be input in OFFLINE mode.)

2 OPERATION

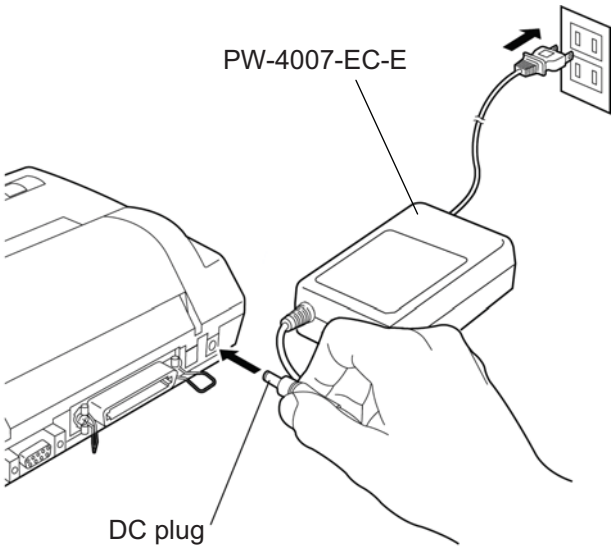
2.1 Connecting AC Adapter

① Turn off the power.

② Plug the DC plug on the AC adapter into the power supply jack on the printer.

③ Plug the AC adapter into an outlet.

④ Turn on the power.



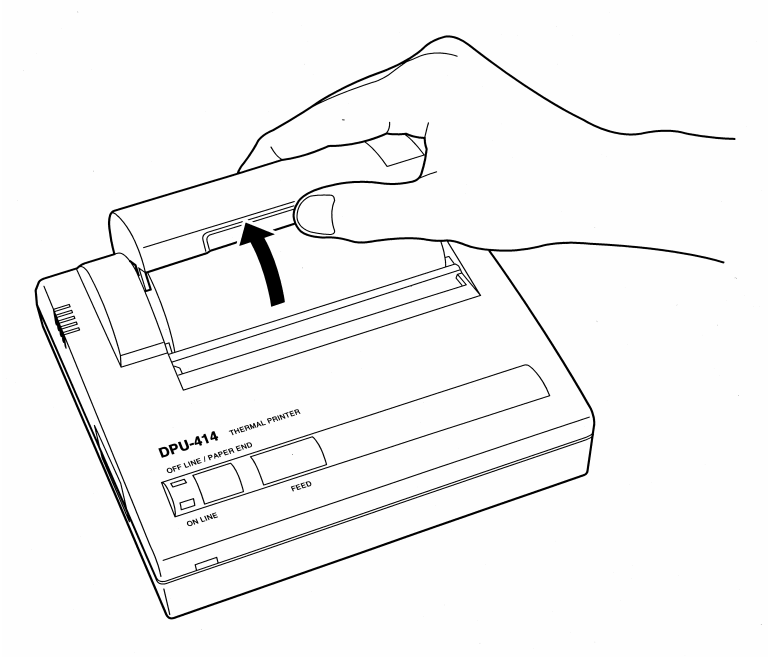
NOTE

- Always use an SII specified adapter.
- DO NOT touch the pins of the DC plug.
- To remove the AC adapter, turn off the power switch first, then unplug the AC adapter and the DC plug.

2.2 Loading the Paper

Opening and Closing the Paper Cover

① Lightly push up on the front of the paper cover with your thumb and rotate it toward the back of the printer.

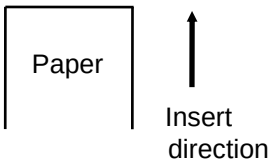


② Close the paper cover and push down on it to lock it into place.

Loading the Paper

① Turn on the power.

② Cut the tip of the paper straight across. Unused Paper can be inserted as is. (See figure on right)



③ Open the paper cover.

④ Push the tip of the paper into the inlet at the bottom of the paper holder, until the auto-loader catches it and feeds about 10cm of it through the paper cutter.

NOTE

◆ Load the paper in an area protected from direct sunlight.

HINT

- Place the paper on the cover to make feeding easier.

The printing surface is the outside of the thermal paper roll.

Insertion Slot

⑤ Keep pressing the paper feed switch until the paper feeds straight and smoothly.

HINT

- When the paper is set correctly, the OFFLINE lamp stops blinking and stays on to indicate the printer is still in OFFLINE mode.
- When the paper is about to run out, red lines appear on both sides of the paper.

2.3 Setting the DIP Switches

The startup settings and input method can be set by the DIP switches (DIP SW). Refer to section 2.4, DIP SW Settings, for details on the different settings.

① Slide the power switch to OFF.

② Slide the power switch to ON while pressing the ONLINE button. Release the ONLINE button after a list of the current settings starts printing out.

③ The print out of the current settings is followed by the prompt: "Continue? :Push 'On-line SW' ",
"Write?: Push 'Paper feed SW' "
To change the DIP SW settings, push the ONLINE button, and move onto step ④.
To leave the DIP SW settings unchanged, push the FEED button, and move onto step ⑤.

④ 'Dip SW1' is printed prompting the input of new settings for switch number 1 through 8 of DIP SW1.

NOTE

◆ Always input either "ON" or "OFF" for every setting in order for switch number 1 through 8 because DIP SW Set Mode can not be canceled once it is initiated.

"ON" can be set by pushing the ONLINE button once and "OFF" by pushing the FEED button once.

The setting is printed out after the ONLINE or FEED button is pushed to allow to confirm the new setting.

As soon as switch number 8 is set, the printer once again prompts with "Continue?" or "Write?", and step ③ is repeated for DIP SW2 and 3.

HINT

• The ONLINE lamp lights when the ONLINE button is pressed and the OFFLINE lamp when the FEED button is pressed to allow confirmation of the button operation.

⑤ After the FEED button is pushed, the ONLINE and OFFLINE lamp alternately blink and the new settings are written to memory. When the printer finishes writing everything to memory, "Dip SW setting

complete!!” is printed out and the printer returns to ONLINE mode.

⑥ As soon as switch number 8 of DIP SW3 is set, the printer writes the settings to memory regardless of which button (ONLINE or FEED) is pushed.

CAUTION

◆ NEVER turn the printer off while it writing the new settings to memory. Always wait until “Dip SW setting complete!!” is printed, then turn the power off.

2.4 DIP SW Settings

(1) Software DIP SW1

indicates factory default setting.

Switch No.	Function	ON	OFF
1	Input Method	Parallel	Serial
2	Printing speed	High	Low
3	Auto loading	ON	OFF
4	CR function	Carriage return and line feed	Carriage return
5	DIP SW Setting Command	Enable	Disable
6 to 8	Print density	See the table below	

Switch No. / Print Density (%)	6	7	8
72	ON	ON	ON
79	ON	ON	OFF
86	ON	OFF	ON
93	ON	OFF	OFF
100	OFF	ON	ON
107	OFF	ON	OFF
114	OFF	OFF	ON
121	OFF	OFF	OFF

HINT

- Set switch number 5 to “ON” when you want to enable DIP SW setting via command.

(2) Software DIP SW2

Switch No.	Function	ON	OFF
1	Print mode	Normal printing (40 columns)	Condensed printing (80 columns)
2	User-defined characters back-up	ON	OFF
3	Chatacter type	Ordinary characters	Special characters
4	Zero font	0	Ø
5 to 8	International character set	See the table below	

Switch No. / Character set	5	6	7	8
Japanese	ON	ON	ON	ON
American	ON	ON	ON	OFF
German	ON	ON	OFF	ON
English	ON	ON	OFF	OFF
French	ON	OFF	ON	ON
Spanish 1	ON	OFF	ON	OFF
Italian	ON	OFF	OFF	ON
Swedish	ON	OFF	OFF	OFF
Danish 1	OFF	ON	ON	ON
Danish 2	OFF	ON	ON	OFF
Norwegian	OFF	ON	OFF	ON
Spanish 2	OFF	ON	OFF	OFF
Latin American	OFF	OFF	ON	ON

CAUTION

◆ DO NOT set switches 5 to 8 a setting other than that shown in the table.

(3) Software DIP SW3

Switch No.	Function	ON	OFF
1	Data bit length	Eight bits	Seven bits
2	Parity permission	Without	With
3	Parity condition	Odd	Even
4	Flow control	H/W BUSY	XON/XOFF
5 to 8	Baud rate	See the table below	

Switch No. / Baud rate	5	6	7	8
75 bps	ON	ON	ON	ON
110 bps	ON	ON	ON	OFF
150 bps	ON	ON	OFF	ON
300 bps	ON	ON	OFF	OFF
600 bps	ON	OFF	ON	ON
1200 bps	ON	OFF	ON	OFF
2400 bps	ON	OFF	OFF	ON
4800 bps	ON	OFF	OFF	OFF
9600 bps	OFF	ON	ON	ON
19200 bps	OFF	ON	ON	OFF
75 bps	OFF	ON	OFF	ON
75 bps	OFF	ON	OFF	OFF
75 bps	OFF	OFF	ON	ON
75 bps	OFF	OFF	ON	OFF
75 bps	OFF	OFF	OFF	ON
75 bps	OFF	OFF	OFF	OFF

2.5 Connecting the Printer

Connection

① Turn off the printer and computer.

② Connect the printer to the computer with an interface cable.

Parallel : Secure with veil lock.

Serial : Secure with screws.

③ Set the printer DIP switches to match the input method.

④ Turn on the printer and the computer.

NOTE

◆ Select the correct interface cable for the type of input (parallel or serial) .

Connectors :

Parallel : Anphenol 36-pin
Equipped connector
: 57LE-40360-7700(D29)(DDK) or equivalent

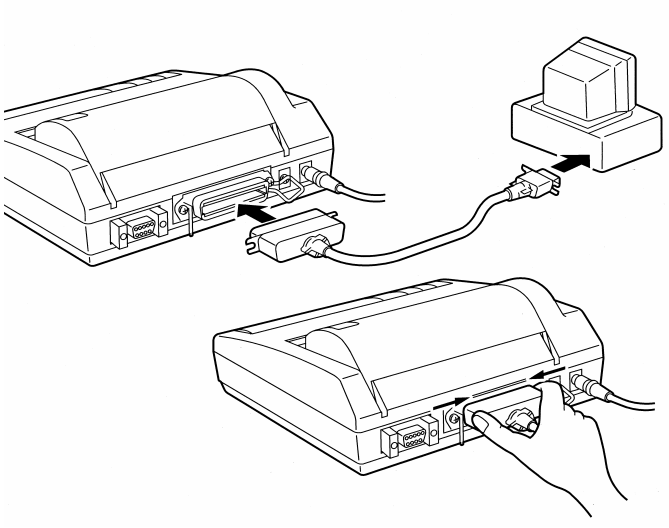
Serial : D-Subminiature type connector with 9-pin
Equipped connector
:(M2.6 type) RDED-9SE-LN(05) (HIROSE)
or equivalent

◆ Use a shielded cable no more than one and a half meters long.

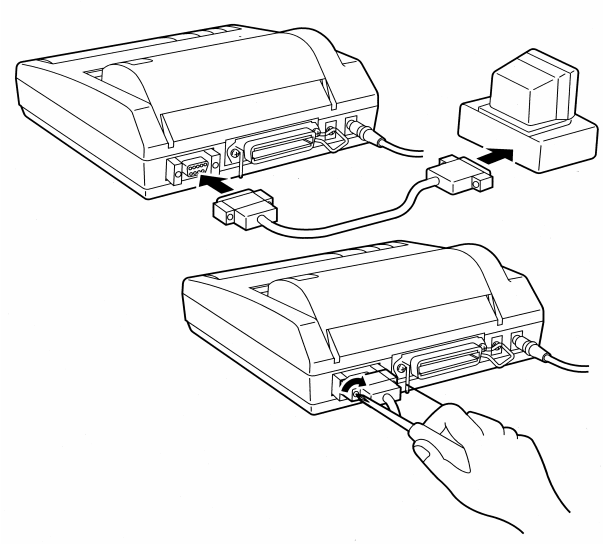
Confirmation

Follow the instructions in section 2.8, *Printing*, to confirm that the printer is connected properly.

Parallel



Serial



2.6 Test Print

In a test print, characters 20_{16} to FE_{16} are printed in condensed, ordinary and double-width modes according to the international, special character and zero font settings of the DIP switches. This is followed by a small checkered pattern and solid black pattern printed dot by dot, after which the current settings are printed. To execute a test print follow this procedure:

① Turn off the power.

② Make sure the paper is inserted correctly.

③ Turn on the power while pressing the Paper feed switch to start the self-test.

④ Release the Paper feed switch as soon as the self-test starts.

Print Sample

NOTE

◆ The printer stops automatically after the test print. DO NOT turn off the power to the printer while it is printing.

2.7 HEX Dump Print

Data input from the computer is printed in hexadecimal codes and in characters to allow you to check if data has been input correctly from the computer.

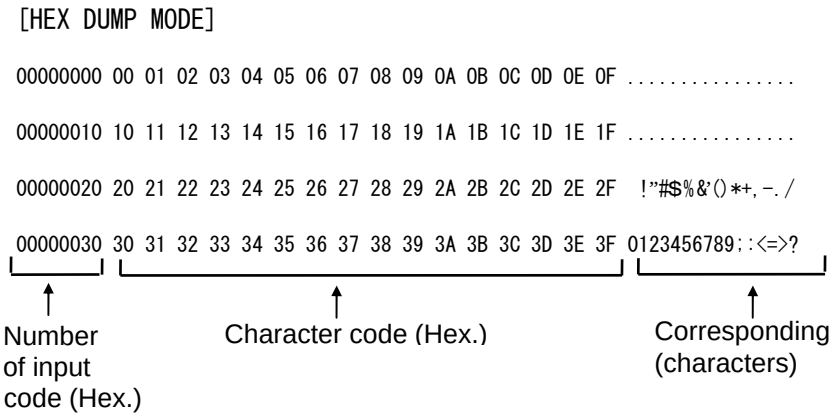
① Turn off the power.

② Turn the power on while pressing the Paper feed switch.

③ Push the On-line switch when the OFFLINE lamp lights (this can be done even if the test print has started).
The printer enters HEX dump mode indicated by the printing of "[HEX DUMP MODE]".

④ Start inputting data. When 16 bytes or more of data have been input, the data is printed as shown below:

Print sample



⑤ Turn the power off to exit HEX dump mode.

HINT

- If you switch the printer to OFFLINE when there is less than 16 bytes per line, the printer goes to OFFLINE after a print-dump. HEX DUMP MODE is reinitiated when the printer is put in ONLINE mode.
- The ONLINE lamp blinks when there is still data in the buffer memory in OFFLINE mode.

2.8 Printing

① Turn on the power to the printer and the computer.

② Check that the ONLINE lamp lights.
When the paper is not set, the OFFLINE lamp blinks. When the paper is loaded, the OFFLINE lamp lights. Press the On-line switch so put the printer ONLINE.

③ Send a print command from the computer to the printer.

Example:

Printing ABC in parallel input using BASIC

① Set DIP SW1-1 to ON.

② Input LPRINT “ABC” on the computer, then press the return key. The printer should print ABC.
If the printer does not print, see Section 6, *Troubleshooting*.

HINT

- Some forms of BASIC use the PRINT# statement or the PR# instead of the LPRINT statement.

2.9 Buffer Memory

The buffer memory, which has a capacity of about 28000 characters (approx. 28KB), receives and stores data at high speed, greatly reducing the time that the computer cannot be used while it outputs to the printer. When the printer is ONLINE, data can be input during printing until the buffer memory becomes full.
If the printer is turned OFFLINE when there is still data in the buffer memory, the ONLINE lamp will blink. Printing resumes when the printer is turned ONLINE.

2.10 Handling the Battery Pack

A fully charged battery pack can print about 3000 lines (40 columns of the number ”8”). The battery discharges when it is not used for a long time, therefore, immediately recharge the battery after purchase or after long periods of storage.

NOTE

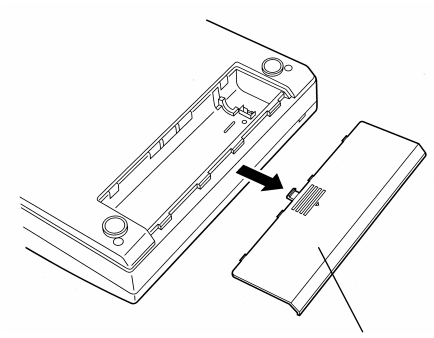
◆ Always use an SII specified battery pack.

Inserting the Battery Pack

① Turn the printer over and open the battery cover as shown in Figure 1.

② Connect the battery pack as shown in Figure 2, turn it so the label is visible, insert it into the printer, and close the battery cover.

③ Close the battery cover.



Battery pack cover

Figure 1

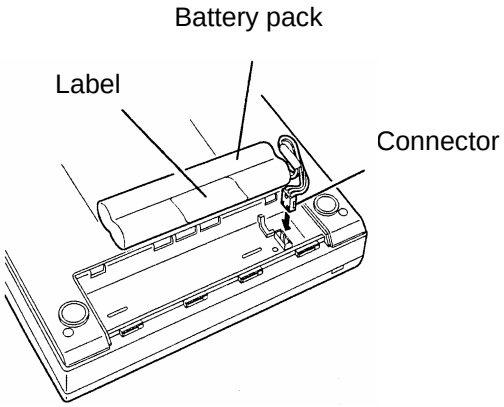


Figure 2

Removing the Battery Pack

① Remove the battery cover as shown in Figure 1.

② Pull out the battery pack, grab the connector with your thumb and index finger, and remove it by pulling up on it.

③ Close the battery cover.

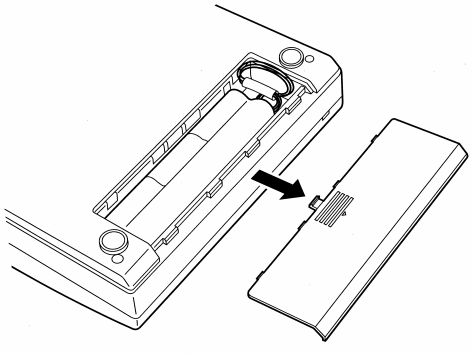


Figure 1

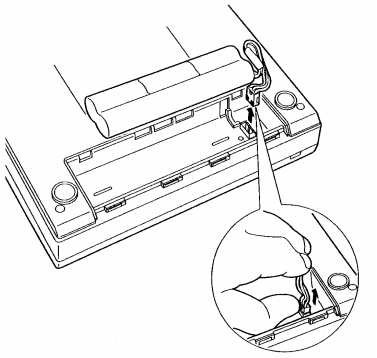


Figure 2

Charging the Battery

① Turn the power OFF.

② Connect the AC adapter to the printer. The POWER lamp will blink once every second indicating the battery is charging.
It takes about 10 hours to fully charge the battery.
When the battery is fully charged, the power lamp stops blinking and goes off.

③ Disconnect the AC adapter.

NOTE

◆ Always charge the battery in a location that is from 5 °C (41 °F) to 40 °C (104 °F) otherwise it may lead to a degradation of the battery.

HINT

- It takes about 15 hours to charge the battery with the power ON.
- Battery charging is temporarily disrupted while the printer is printing and resumed automatically when printing is completed.

When the Battery Gets Low During Printing

When the power lamp starts blinking about once every 0.5 seconds and the printer goes OFFLINE, connect the AC adapter.

The ONLINE lamp will blink if there is data left in the memory buffer. In order to print the remaining data, connect the AC adapter as quickly as possible and push the ONLINE button.

NOTE

- Battery efficiency will decrease if battery is recharged more than necessary. Confirm whether power lamp is blinking and battery charge has decreased before recharging battery.
- When using the rechargeable battery:
  Turn off the power switch after use.
  Leaving power switch ON will consume battery and eventually run battery out, leading to low performance and malfunction.
- When using the AC adapter:
  The battery gradually recharges regardless of whether or not the power is on/off. If you are not using the printer, turn off power switch, and unplug the AC adapter.

3 PRINTER FUNCTION

3.1 Buffer Full Printing

The DPU-414 has a line buffer to receive data in one-line units. If data with more columns than one line is received, printing will start, even if there is no print command.
This is called "*Buffer full printing*".

3.2 Interval Home Return

To protect the printer, the head returns to the home position (the leftmost position) automatically when;

- data is not sent from the computer
- the ONLINE button is pressed to set the printer OFFLINE
- the printer runs out of paper

3.3 Errors

Both the ONLINE and OFFLINE lamps light and data input and paper feed are disabled when one of the following four errors occurs:

A The head does not return to the home position even when the power is turned on;

B The head does not return to the home position at interval home return;

C Printing is attempted at extremely low or high ambient temperatures;

D The battery runs out.

If an error appears:

① Turn off the power switch.

② Remove the cause.
For A and B, remove any foreign objects.
For C, use the printer at 0 to 40 °C (32 to 104 °F).
For D, connect the AC adapter and charge the battery.

③ Turn on the power switch.

3.4 Paper-Out Detection

When paper runs out, the printer goes OFFLINE and the OFFLINE lamp flashes. The printer cannot be set ONLINE while the OFFLINE lamp is flashing. When paper has been loaded, the OFFLINE lamp stops flashing, and stays lit. Press the ONLINE button to print.
If paper runs out during printing, the printer will go OFFLINE. Load new paper and press the ONLINE button to resume printing.

4 CONTROL CODE

The DPU-414 uses control codes to change forms and characters. The control codes are not printed. There are two types of function codes: basic function codes that can be used independently and extended function codes used with the ESC Sequence.

Basic codes

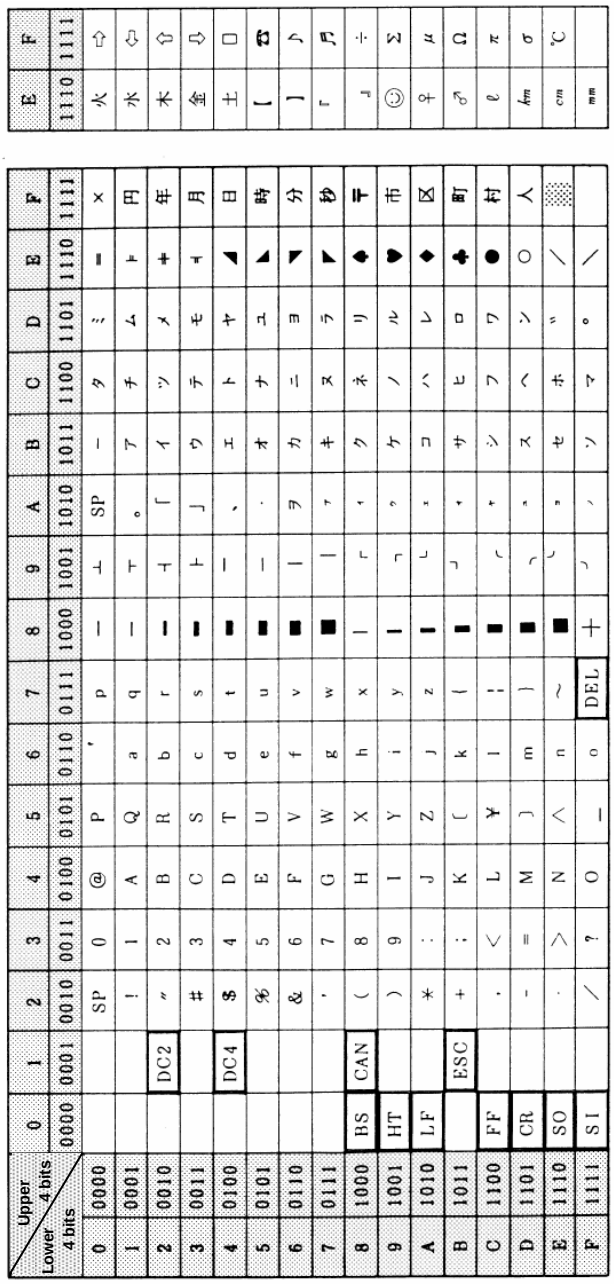
Code	Function
BS	Back space
HT	Horizontal tab
LF	Line feed
FF	Form feed
CR	Carriage return
SO	Set double-width printing by line
SI	Set condensed printing
DC2	Reset condensed printing
DC4	Reset double-width printing by line
CAN	Cancel
DEL	Delete

ESC sequence codes

Code	Function
ESC+ ”%” +n	Select user-definable characters
ESC+ ”&” +s+n	Register user-definable characters
ESC+ ”:” +s+SP+SP	Delete user-definable characters
ESC+ ”0”	Set 11-dot line feed
ESC+ ”2”	Set 15-dot line feed
ESC+ ”3”	Set line feed length in half dots
ESC+ ”.” +n1+n2+n3	Function settings
ESC+ ”: ” +s+n+m	Font copy
ESC+ ”;” +n+s	User-defined characters back-up
ESC+ ”@”	Reset
ESC+ ”A” +n	Set line feed length in dots
ESC+ ”C” +n	Set page length
ESC+ ”E”	Set emphasized printing
ESC+ ”F”	Reset emphasized printing
ESC+ ”G”	Set double-strike printing
ESC+ ”H”	Reset double-strike printing
ESC+ ”J” +n	Line feed in half dots
ESC+ ”K” +n1+n2	Set single-density bit -image graphics mode
ESC+ ”L” +n1+n2	Set horizontal double-density bit-image graphics mode
ESC+ ”N” +n	Set skip length
ESC+ ”O”	Reset skip length
ESC+ ”Q” +n	Set right margin
ESC+ ”R” +n	Select international characters
ESC+ ”S” +n	Set superscript or subscript printing
ESC+ ”T”	Reset superscript or subscript printing
ESC+ ”U” +n	Select printing direction
ESC+ ”W” +n	Select double-width printing
ESC + ”^” +m+n1+n2	Set vertical double-, or quadruple-density bit-image graphics mode
ESC + ”c” +n	Select special characters
ESC + ”ℓ” +n	Set left margin
ESC + ”z” +n	Select zero font

5 CHARACTER CODE TABLE

- Japanese Character Set
  The following table is the Japanese character set when 0 is set to normal 0.



Upper 4 bits / Lower 4 bits	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000		SP	0	@	P	'	p	—	┴	SP	—	タ	ミ	一	×
1	0001		!	1	A	Q	a	q	—	┬	。	ア	チ	ム	ト	円
2	0010	DC2	"	2	B	R	b	r	┣	┤	「	イ	ツ	メ	╋	年
3	0011		#	3	C	S	c	s	┣	├	」	ウ	テ	モ	ヤ	月
4	0100	DC4	$	4	D	T	d	t	┣	─	、	エ	ト	ヤ	◢	日
5	0101		%	5	E	U	e	u	┣	─	・	オ	ナ	ユ	◣	時
6	0110		&	6	F	V	f	v	┣	─	ヲ	カ	ニ	ヨ	◥	分
7	0111		'	7	G	W	g	w	┣	─	ァ	キ	ヌ	ラ	◤	秒
8	1000	BS	(	8	H	X	h	x	┣	┌	ィ	ク	ネ	リ	♠	千
9	1001	HT	)	9	I	Y	i	y	┣	┐	ゥ	ケ	ノ	ル	♥	市
A	1010	LF	*	:	J	Z	j	z	┣	└	ェ	コ	ハ	レ	◆	区
B	1011	ESC	+	;	K	[	k	{	┣	┘	ォ	サ	ヒ	ロ	♣	町
C	1100	FF	,	<	L	¥	l	|	┣	┌	ャ	シ	フ	ワ	●	村
D	1101	CR	-	=	M	]	m	}	┣	┐	ュ	ス	ヘ	ン	○	人
E	1110	SO	.	>	N	^	n	~	■	┘	ョ	セ	ホ	"	／	▒
F	1111	SI	/	?	O	_	o	DEL	+	┘	ッ	ソ	マ	°	＼	

E	F
1110	1111
火	⇨
水	⇦
木	⇧
金	⇩
土	□
「	☎
」	♪
「	♫
」	÷
㋮	Σ
♀	μ
♂	Ω
ℓ	π
km	σ
cm	℃
mm	

- SP denotes space.
- Blank codes are ignored.
- Function codes are enclosed in thick lines.

- IBM Character Set
  The following table is the English character set when 0 is set to normal 0 .

Upper 4 bits / Lower 4 bits	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000		SP	0	@	P	`	p	C	É	á	▒	└	╨	α	≡
1	0001		!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	0010	DC2	"	2	B	R	b	r	é	Æ	ó	▒	┬	╥	Γ	≥
3	0011		#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	0100	DC4	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	0101		%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	0110		&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	0111		'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	1000	BS	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	1001	HT	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	θ	∙
A	1010	LF	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	1011		+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C	1100	FF	,	<	L	\	l	¦	î	£	¼	╝	╠	▄	∞	n
D	1101	CR	-	=	M	]	m	}	ì	¥	¡	╜	═	▌	φ	²
E	1110	SO		>	N	^	n	~	Ä	Pt	«	╛	╬	▐	ε	■
F	1111	SI		?	O	_	o	DEL	Å	ƒ	»	┐	╧	▀	∩	

E	F
1110	1111
Ø	→
ϕ	←
IJ	↑
ij	↓
Œ	§
œ	¶
№	†
ŉ	‡
¢	▪
Þ	▷
Ŧ	▲
≠	◆
∧	¾
∨	‰
∀	°F
∴	

- SP denotes space.
- Blank codes are ignored.
- Function codes are enclosed in thick lines.

6 SPECIFICATIONS

6.1 General Specifications

Printer specifications

Printing method	: Thermal serial dot
Character mode	
Total number of dots	: 9 × 320 dots / line
Character matrix	: 9 dot high × 7 dot wide
Space between characters	: 1dot
Columns	: 40 column (normal), 80 column (condensed)
Printing direction	: Unidirectional or bidirectional logical seek
Bit-image graphics mode	
Total number of dots	: 8 × 320 dots / line
Printing direction	: Unidirectional logical seek
Printing width	: 89.6mm
Printing speed	: Max. 52.5cps (normal), Max. 80cps (condensed)
External dimensions	: 160mm × 170mm × 66.5mm
Mainframe mass	: Approx. 580g (excluding battery)
Life	: Approx. 500, 000 lines (continuous printing of 40 columns of “8”) (when print density is 100%)
Regulation	: The printer complies with regulation in following countries*1: USA, Canada, EU, Japan, China, Taiwan, Korea and Australia *1 Please ask if the printer can use in other than countries above to our sales representative.

Operating conditions

Temperature	: 0 to 40 °C (32 to 104 °F)
Humidity	: 30 to 80% RH (non-condensing)

Thermal paper specifications

Product No.	: TP-411L
Width	: 112mm
Outer diameter	: 48mm
Roll length	: Approx. 28m

Specifications of Specified AC Adapter (Option)

Item	JU Type	EC Type
Product No.	PW-4007-JU1-E	PW -4007-EC-E
Input	100VAC to 120VAC 50Hz to 60Hz	230VAC 50/60Hz
Output	7.0VDC 2.0A	6.5VDC 2.0A
Dimensions	104mm × 43mm × 32mm Cable length : 1.85m	89mm × 51mm × 28mm Cable length : 1.83m
Mass	Approx. 160g	Approx. 160g
Regulation *1	USA, Canada, Taiwan	EU, Australia

*1 Please ask if the AC adapter can use in other than countries above to our sales representative.

Specifications of the AC Cable (Option PW-4007-JU1-E only)

Product No. : CB-US04-18A-E
Cable length : Approx. 1.75 m
Regulation *1 : USA, Canada

*1 Please ask if the AC cable can use in other than countries above to our sales representative.

Specifications of the AC Cable (Option PW-4007-EC-E only)

Product No. : CB-CE01-18B-E
Cable length : Approx. 1.8 m
Regulation *1 : EU

Product No. : CB-AU01-20A-E
Cable length : Approx. 2.0 m
Regulation *1 : Australia

*1 Please ask if the AC cable can use in other than countries above to our sales representative.

Specifications of the Battery pack (Option)

Product No. : BP-4005-E
Cell type : Ni-MH
Rated Voltage : 4.8V
Mass : Approx. 120g

6.2 Interface Specifications

Parallel

(1) Specifications

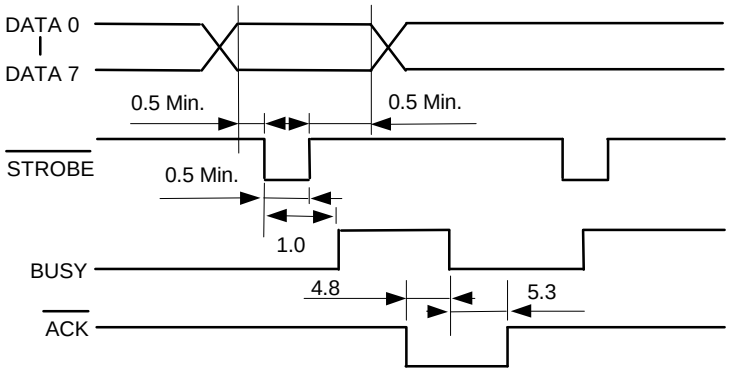
Data input : Eight-bit parallel (Centronics)
Handshake: $\overline{\text{STROBE}}$, BUSY, and $\overline{\text{ACK}}$

(2) Connector signal description

Pin no.	Signal	I/O	Function
1	$\overline{\text{STROBE}}$	Input	Data strobe
2 to 9	DATA 0 to 7	Input	Carries the input data 1 when high and 0 when low
10	$\overline{\text{ACK}}$	Output	Signal showing that data is received
11	BUSY	Output	Signal showing that data cannot be received
12	PE	Output	Signal showing that there is no paper
13	SLCT	Output	Signal showing that the printer is ONLINE
14	$\overline{\text{AUTO}}$ ・ $\overline{\text{LF}}$	Input	When this signal is low at power-on, one line feed is performed at carriage return
15	NC	—	Not used
16	GND	—	Ground
17	FG	—	Frame Ground
18	NC	—	Not used
19 to 30	GND	—	Twist, pair, and ground for return signal
31	$\overline{\text{INIT}}$	Input	Initialize
32	$\overline{\text{ERROR}}$	Output	Signal showing that there is an error
33	GND	—	Ground
34	NC	—	Not used
35 and 36	+5V	—	Normally, pulled up at 4.7kΩ at high

(3) Data Input Timing

(Unit: μs, typical)



(4) Signal Conditions

Item	Standard			Unit
	Min.	Typical	Max.	
Input : Low Level Voltage	0.0	—	0.9	V
Input : High Level Voltage	3.5	—	5.0	V
Output : Low Level Voltage	—	—	0.5	V
Output : High Level Voltage	3.5	—	—	V

Serial

(1) Specifications

Data input : RS-232C
Data control : H/W BUSY, XON/XOFF

(2) Connector signal description

Pin no.	Signal	I/O	Function
1	NC	—	Not used
2	TxD	Output	XON/XOFF Output
3	RxD	Input	Data reception
4	—	—	Connected to pin 6
5	GND	—	Ground
6	—	—	Connected to pin 4
7	NC	—	Not used
8	RTS	Output	Data send request
9	NC	—	Not used

Computer connections

Computer	DPU-414
RxD	2 TxD
TxD	3 RxD
DTR	4 Connected to pin 6
GND	5 GND
DSR	6 Connected to pin 4
RTS	7 NC
CTS	8 RTS

(3) Error processing

The following characters are printed when an error occurs.
? ($3F_{16}$) : Framing error
! (21_{16}) : Parity error
* ($2A_{16}$) : Overrun error

Turn the power off and check computer and DPU-414 DIP switch settings.

NOTE

◆ Always power OFF the printer before the host computer. Powering OFF the computer before the printer may cause the printer to print several lines of "?" due to a FLAMING ERROR triggered by an unstable signal output from the computer at power OFF. It does not imply a printer malfunction.

(4) Signal Conditions

Item	Standard			Unit
	Min.	Typical	Max.	
Input : Low Level Voltage	-15.0	—	-3.0	V
Input : High Level Voltage	3.0	—	15.0	V
Output : Low Level Voltage	—	-12.0	—	V
Output : High Level Voltage	—	12.0	—	V

7 TROUBLESHOOTING

Check the following points if your printer has malfunctioned or does not operate at all. If it has still problems, call your SII representative or the branch office.

If the power does not turn on (the power lamp is off)

Checkpoint	Action	Reference page
Is the power switch on?	Turn on power switch.	—
Is the AC adapter connected correctly?	See Section 2.1.	12
Is the battery recharged? (When using a battery)	See Section 2.10.	25
Is power being supplied from the outlet?	Plug other electrical appliances into the outlet to check that it is working.	—

If the paper does not feed

Checkpoint	Action	Reference page
Is the paper loaded correctly?	See Section 2.2.	13
Is there foreign matter in the paper inlet?	Remove any foreign objects.	—
Are the ONLINE and OFFLINE lamps on?	An error has occurred. See Section 3.3.	28
Is the ONLINE lamp off?	Set the printer OFFLINE.	10

If the printer does not print or stops during printing

Checkpoint	Action	Reference page
Is the OFFLINE lamp flashing?	The paper has run out. Load more paper.	14
Are the ONLINE and OFFLINE lamps on?	An error has occurred. See Section 3.3.	28
Is the OFFLINE lamp on?	Set printer ONLINE.	10
Is the ONLINE lamp ON and the POWER lamp blinking?	If you cannot set it ONLINE, the battery has discharged. Connect the AC adapter.	—
Is the ONLINE lamp flashing?	Connect the AC adapter and set the printer ONLINE.	—
Are the DIP switches set correctly?	Set them according to the input method.	15
Is the interface cable connected correctly?	See Section 2.5.	20
Are you using specified paper?:TP411L?	Use the specified paper	—
Are you using back of paper?	The outside is the front. See Section 2.2.	13
Is the program correct?	Check the program. The LPRINT statement in BASIC is usually used, but some machines use the PRINT# or the PR# statement.	—
Does the printer execute a self-test?	If it does not execute a self-test, contact your SII representative or local branch office.	22

If the printer prints wrong characters

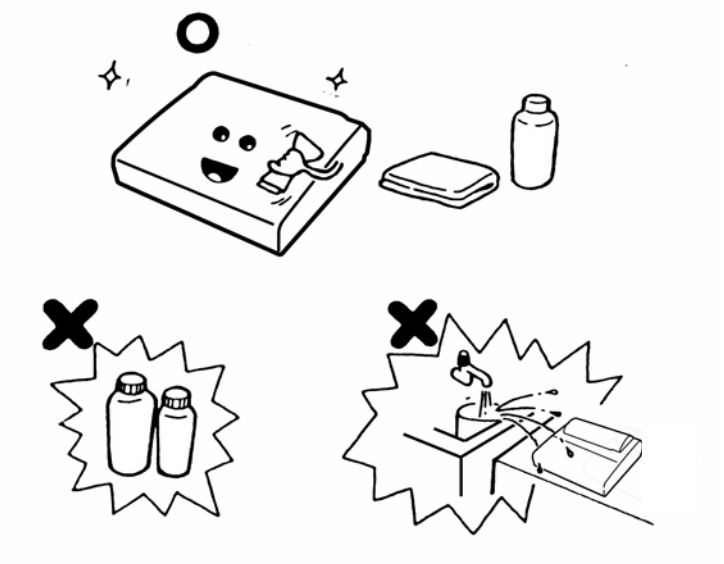
Checkpoint	Action	Reference page
Is interface cable connected correctly?	See Section 2.5.	20
Are the DIP switches set correctly?	Set the DIP switches according to the input method. In serial input, “!”, “?”, “*” is printed for the incorrect set at DIP SW3. Set them according to the computer communications method.	15
Is the program correct?	Check the program. Unless “;” is input following the LPRINT Statement in BASIC, usually CR and LF are automatically output.	—

If the printing is light or dark

Checkpoint	Action	Reference page
Is the temperature very high or low?	Use the printer at 0 to 40 °C.(32 to 104 °F)	—
Are you using the specified paper : ***TP411L***?	Use the specified paper.	—
Are the DIP switches set correctly?	Check the print density DIP SW settings.	17

8 CARING FOR THE DPU-414 PRINTER

If the outside of your printer gets dirty, wipe it with a soft, dry cloth. If it gets very dirty, wet a soft cloth with mild detergent diluted with water, squeeze it well, and clean the printer.



NOTE

- DO NOT use thinner, benzine, or other volatile chemicals.
- DO NOT allow water to get inside the printer.

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(Specifications are subject to change without notice.)